MECHANICS.

No. I.

DIAGRAMS FOR FINDING THE LENGTH AND BEVELS OF RAFTERS.

The SILVER ISIS MEDAL *was presented to Mr.* JOSEPH JEAY, 6 *Oxford Market, for his Method of finding the Length and Bevels of the various Timbers in a Hip-roof.*

IN works on practical carpentry, of which that by the late Mr. Nicholson is, perhaps, one of the best, are methods of computing the length and bevels of rafters. But these methods are complex, require many lines in the diagrams, and do not directly give the dimensions of the jack-rafter. Mr. Jeay's method is strictly geometrical, requires few lines, and also gives the length of the jack-rafter. On these accounts, the Society have thought proper to reward the ingenious inventor, and to render public a method more convenient, and more largely applicable than those in common use.

The candidate stated to the Committee, that he has applied his method in the construction of the roof of the Lunatic Asylum at Leicester, and at Bitterswell Hall, near Lutterworth, where he was professionally employed.

Let A E D C, fig. 1, represent the wall-plates of a building; A B C a vertical and transverse section of the roof, A B and B C being the common rafters. The dotted lines E F, D F, the seats of the hips; and the line

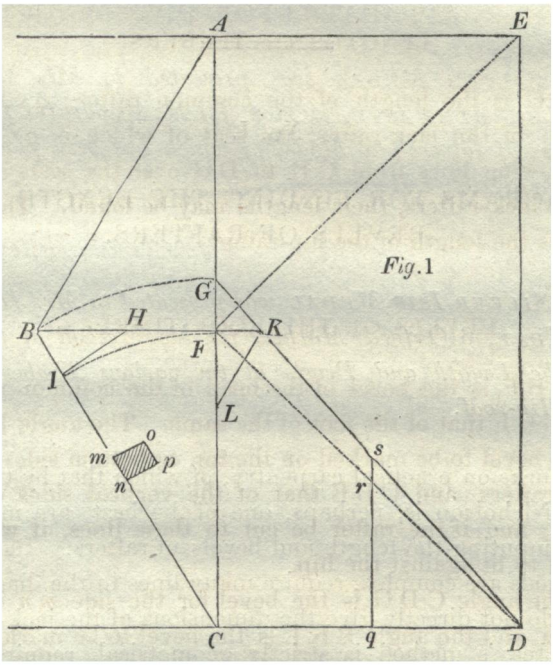


Fig. 1

$q\,r$ the seat of a jack-rafter. B K a line from the ridge at right angles to the line A C; and $m\,n\,o\,p$ a section of the purlin placed in its real position with respect to the common rafter.

Then, with C as a centre and radius C B cross the line A C in G, and with the same centre and radius C F cross the line C B in J; join the points D and G, and from the point J draw the line G H perpendicular to C B,

meeting B K in H; set off the distance J H along the line A C from F to L, and join the points K and L, and produce the line *q r* to *s*.

This being done, the lengths and bevels are as follows: —

LENGTHS OF TIMBERS.

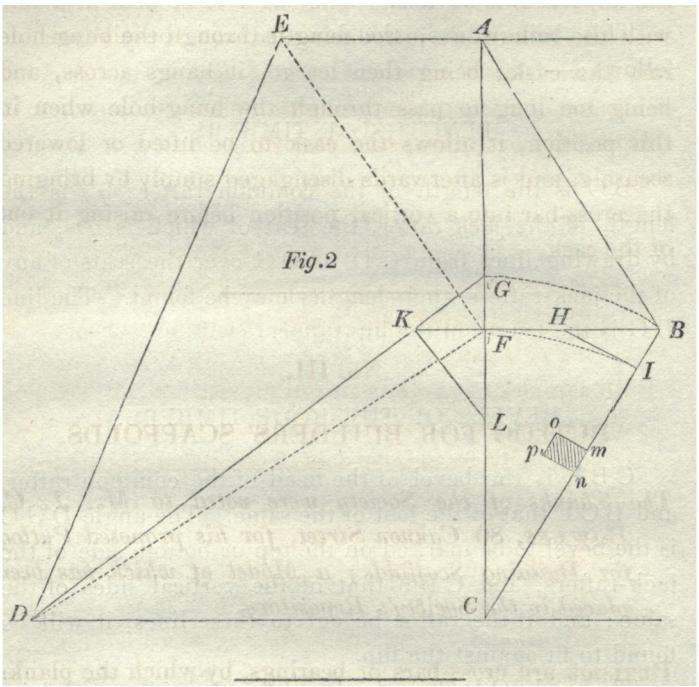
B C is the length of the common rafter; *q s* is the length of the jack-rafter, the seat of which is *q r;* and by drawing lines from C D to D G over the seats of any of the jack-rafters, their lengths may be found. The line D G is the length of the hip-rafter.

BEVELS OF THE ROOF TIMBERS.

C B F is the bevel of the head of the common rafter, and B C F that of the foot of the same. The angle D G C is the bevel to be marked on the top or bottom side of the jack-rafters, and C B F that of the vertical sides of the same; and if the rafter be cut to these lines, it will be found to fit against the hip.

The angle C D G is the bevel for the side *m n* of the purlin, and the angle B K L is the bevel to be marked on the side *m o;* and if the purlin be cut to these lines, it will be found, when placed in its proper position, exactly to fit against the side of the hip-rafter.

Fig. 2 shews the application of the above to a building with an oblique end.



No. II.

RAISING EMPTY CASKS.

The Thanks of the Society were voted to Mr. J. C. Bowles, 80 *Cannon Street, for his Apparatus for Raising Empty Casks, one of which has been placed in the Society's Repository.*

Mr. Bowles's apparatus consists of a link attached to the end of the lifting rope, and terminating below in a